What is claimed is:

[01] An architecture for the measurement of photomask optical path difference, comprising:

A spatially coherent light source;

An interferometric beam processing module;

An optical microscope; and

A photosensitive detector;

Wherein said module is disposed to receive and divide light from said light source into a number of phase-coherent light beams, each of which passes through a separate aperture;

Wherein said microscope is disposed to image the multitude of said apertures in said module with a given demagnification onto a photomask; and

Wherein said detector is disposed to record transmitted fringe intensity.

[02] The apparatus of claim 1 wherein said light source is a laser with a wavelength that is approximately the same as the actinic wavelength of said photomask.

[03] The apparatus of claim 1 wherein said optical demagnification of said apertures is greater than 50.

[04] The apparatus of claim 1 wherein said module is of the Mach-Zehnder (MZ) interferometer type.

[05] The apparatus of claim 1 wherein the relative optical phase between said phase-coherent light beams may be varied by suitable adjustments to said interferometric beam module.

[06] The apparatus of claim 1 wherein said module is a dual-aperture screen.

[07] The apparatus of claim 1 wherein said module contains mirrors are fabricated using the techniques of micro-electrical and mechanical system (MEMS).

[08] The apparatus of claim 1 wherein said detector is a UV-sensitive CCD camera.

[09] The apparatus of claim 1 wherein said detector is a photomultiplier tube (PMT).

[10] The apparatus of claim 1 wherein the number of said apertures and said phase-coherent light beams is two (2).

[11] An architecture for the measurement of photomask optical path difference, comprising:

A spatially coherent light source;

An interferometric beam processing module;

An optical microscope; and

A photosensitive detector;

Wherein said module is disposed to receive and divide the light from said light source into a number of phase-coherent light beams, each of which passes through a separate aperture;

Wherein said microscope is disposed to image the multitude of said apertures in said module with a given demagnification onto a photomask; and

Wherein said detector is disposed to record reflected fringe intensity

[12] The apparatus of claim 11 wherein said light source is a laser with a wavelength that is approximately the same as the actinic wavelength of said photomask.

[13] The apparatus of claim 11 wherein said optical demagnification of said apertures is greater than 50.

[14] The apparatus of claim 11 wherein said module is of the Mach-Zehnder (MZ) interferometer type.

[15] The apparatus of claim 11 wherein the relative optical phase between said phase-coherent light beams may be varied by suitable adjustments to said interferometric beam module.

[16] The apparatus of claim 11 wherein said module is a dual-aperture screen.

[17] The apparatus of claim 11 wherein said module contains mirrors are fabricated using the techniques of micro-electrical and mechanical system (MEMS).

[18] The apparatus of claim 11 wherein said detector is a UV-sensitive CCD camera.

[19] The apparatus of claim 11 wherein said detector is a photomultiplier tube (PMT).

[20] The apparatus of claim 11 wherein the number of said apertures and said phase-coherent light beams is two (2).